

Trend Study 15-13-99

Study site name: Sidehill Spring.

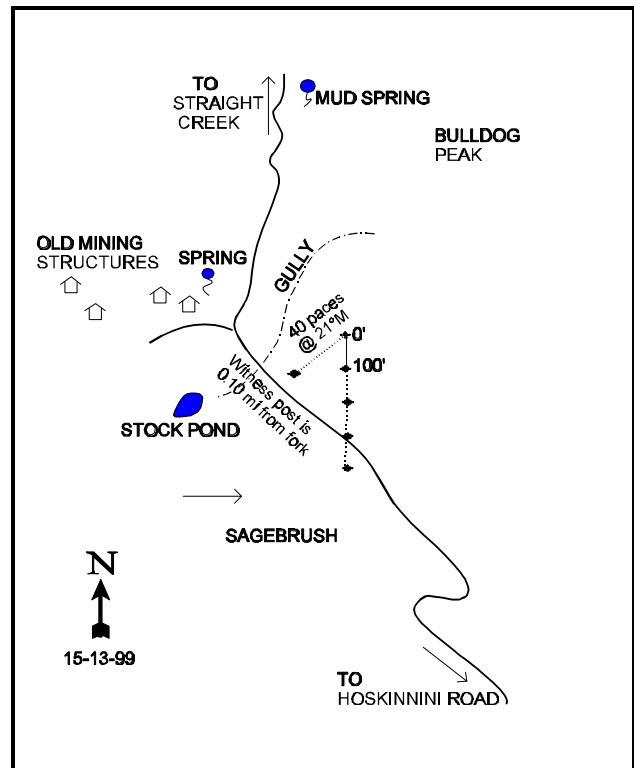
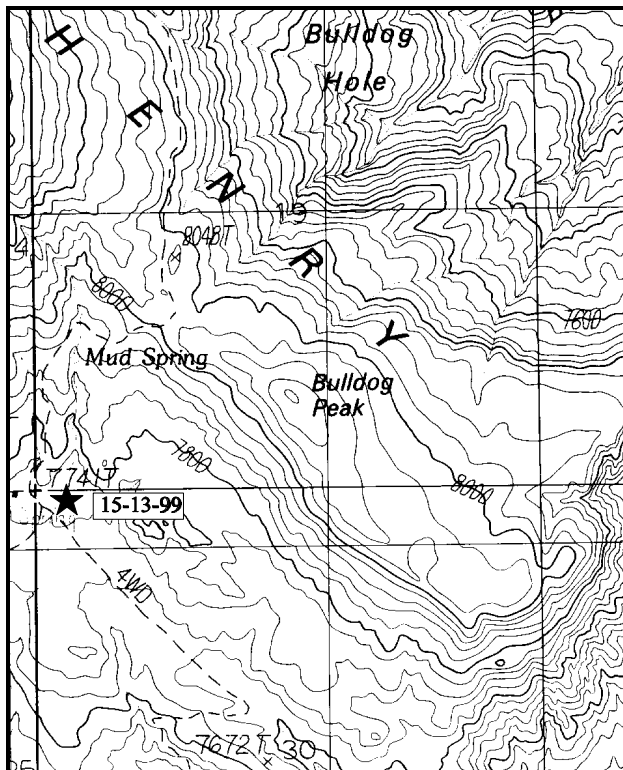
Range type: Big Sagebrush.

Compass bearing: frequency baseline 170°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From Straight Creek Junction (T33S, R10E, Sec. 12), proceed south on the main road for 0.3 miles to Straight Creek. Continue 3.6 miles to a minor fork by a spring, stock pond and some abandoned cabins. Bear left on the main road, cross a small wash and less than 0.1 miles into the sage flat where a witness post for the transect is found on the left side of the road. The study area is northeast of the witness post. The 0-foot stake has browse tag #472 attached, and is 40 paces away at a bearing of 21°M from the witness post.

Map Name: Cass Creek Peak

Diagrammatic Sketch

Township 33S, Range 11E, Section 19

UTM 4196156.687 N, 522200.116 E

DISCUSSION

Trend Study No. 15-13(38-13)

The Sidehill Spring study is located in a relatively small mountain big sagebrush flat approximately one-half mile west of Bulldog Peak and halfway between Mt. Pennell and Mt. Hillars. The elevation at the site is 7,700 ft and the slope is gradual (4-5%) with a southeast aspect. Precipitation at this elevation probably averages close to 15 inches per year. The sagebrush flat is surrounded by a pinyon-juniper/oak woodland with young trees scattered throughout the flat. Pinyon and juniper have a combined estimated canopy cover of 7%. The area is within the Pennell Allotment. Water is available for livestock and wildlife in a nearby spring, creek, and stock pond. This is considered a key area for mule deer during the summer and during mild winters. The 1999 pellet count data estimate 18 deer days use/acre (44 ddu/ha). This area is currently only lightly used by livestock even though water is available nearby. Pellet transect data from 1999 estimates 25 cow days use/acre (63 cdu/ha). There is evidence of past mining activity; a cabin, pump house, and old mining equipment is located near the spring. The road past the site is seldom used, but perhaps limited use during the hunting season.

The soil is a moderately deep clay loam with an estimated effective rooting depth of over 22 inches. Soil penetrometer readings used to estimate a stoniness profile index, indicate the vast majority of rock to be at least 16 inches down in the profile. There is very little rock or pavement on or near the soil surface. Black sagebrush is present in small scattered patches on the site indicating that at least some rocky, shallow portions exist in the soil profile. Several small gullies are present throughout the site with pedestaling occurring around the base of sagebrush plants. Some gullies appear to be in the process of healing with sloping sides and persistent vegetation. A large active gully is present west of the study site. Organic matter content is low and phosphorus levels are below the 10 ppm determined necessary for normal plant development. The soil is slightly alkaline (pH of 7.5).

A dense stand of mountain big sagebrush dominates the site. Sagebrush density has shown increases each sampling date to where it is now 5,920 plants/acre. Cover of sagebrush has remained relatively stable at about 19% over all sampling years. This dense stand will greatly limit the production of any herbaceous species. Use is mostly light and vigor is good on the majority of the sagebrush. Percent decadency declined from 29% in 1994 to 12% in 1999. However, 53% of the decadent plants were classified as dying in 1999. The number of young plants (800/acre) appears to be adequate to replace those individuals that are dying. Low rabbitbrush is also abundant with an estimated density of 8,340 plants/acre in 1994, up to 11,000 plants/acre in 1999. Mature plants make up 87% of the population. Although use is light on all plants sampled in 1999, plants have a hedged appearance and are small statured. Other important species that occur in low densities include Utah serviceberry and black sagebrush.

During the 1994 reading, grasses made up only 6% of the vegetative cover while forbs provided 13% of the vegetative cover. In 1999, grass cover dramatically increased to nearly 19% (32% of the total vegetative cover) due to the explosion of the annual cheatgrass. Cheatgrass currently provides 89% of the grass cover and 74% of the herbaceous cover. This presents a fire hazard to the sagebrush population and is a cause for concern as it competes with seedlings for establishment. Perennial grasses declined in nested and quadrat frequencies between the 1994 and 1999 readings. Perennial forbs also decreased in nested and quadrat frequency, and no annual forbs were sampled in 1999. Silky lupine remains the dominant forb as it provides 96% of the forb cover at the site. However, it decreased significantly in nested and quadrat frequency in 1999.

1994 TREND ASSESSMENT

Basic ground cover estimates are similar to those of 1987. Erosion is occurring on the site, nevertheless it does not appear to be severe. Continued increases in the shrub component will tend to accelerate erosion

problems on this site. Trend for soil is currently stable. The browse population on this site is relatively dense. There are a combined total of 15,020 shrubs/acre on this site. Mountain big sagebrush and rabbitbrush account for 97% of that total. Both populations appear healthy with low percent decadency and dynamic biotic and reproductive potentials. Trend for browse is stable at this time, but an increase in decadency of sagebrush and rabbitbrush will likely occur in the future as the intraspecific and interspecific competition becomes more intense when coupled with continued drought. The herbaceous component is severely limited due to the abundance of shrubs. Sum nested frequencies of perennial grasses have declined slightly, while those of perennial forbs increased. Nested frequency of silky lupine increased by 36%. Overall, trend for herbaceous understory is up but still deficient of perennial grasses which noted a slight drop in their nested frequency values. Thinning of sagebrush and rabbitbrush would be required before a more substantial improvement of the herbaceous understory is realized.

TREND ASSESSMENT

soil - stable

browse - stable

herbaceous understory - improved, but still deficient

1999 TREND ASSESSMENT

Trend for soil is stable. The increase in cheatgrass brome decreased the amount of bare soil, while increasing herbaceous vegetative cover. Erosion is evident at the site with pedestaling around shrub stems, however some of the gullies at the site appear to be healing with herbaceous cover. Trend for the key browse, mountain big sagebrush, is stable. Percent decadency decreased from 29% in 1994 to 12% currently. Use is mostly light and vigor is good on most plants. The main negative indicator for sagebrush is the high proportion of decadent plants classified as dying (53%). However, recruitment from young plants is good at 14% and should provide enough incoming individuals to offset the loss of those that are dying. Trend for the herbaceous understory is down. The annual cheatgrass is by far the dominant species and is rapidly increasing over the site. Also, the quadrat and sum of nested frequencies for perennial grasses and forbs decreased in 1999.

TREND ASSESSMENT

soil- stable

browse- stable

herbaceous understory- down

HERBACEOUS TRENDS --
Herd unit 15 , Study no: 13

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
G	Agropyron spp.	_b 9	_a -	-	4	-	-	-	-
G	Agropyron spicatum	-	-	-	-	-	-	-	.01
G	Bouteloua gracilis	-	4	3	-	1	1	.00	.00
G	Bromus tectorum (a)	-	_a 163	_b 326	-	61	94	.80	16.80
G	Hilaria jamesii	2	-	-	1	-	-	-	-
G	Oryzopsis hymenoides	_b 33	_a 13	_a 16	18	6	10	.13	.17
G	Poa interior	-	4	2	-	1	1	.03	.00
G	Sitanion hystrix	_b 138	_b 138	_a 88	65	54	39	1.36	1.94
G	Stipa lettermani	_a -	_b 6	_b 1	-	3	1	.01	.03
Total for Annual Grasses		0	163	326	0	61	94	0.80	16.80
Total for Perennial Grasses		182	165	110	88	65	52	1.55	2.16
Total for Grasses		182	328	436	88	126	146	2.35	18.97
F	Astragalus spp.	-	-	-	-	-	-	-	.00
F	Castilleja chromosa	-	-	1	-	-	1	-	.03
F	Castilleja linariaefolia	-	-	2	-	-	1	-	.38
F	Calochortus nuttallii	_a 7	_b 54	_b 41	4	26	19	.14	.29
F	Gayophytum ramosissimum (a)	-	_b 9	_a -	-	4	-	.02	-
F	Ipomopsis aggregata	_b 11	_a -	_a -	5	-	-	-	-
F	Lappula occidentalis (a)	-	4	-	-	2	-	.01	-
F	Linum lewisii	5	3	-	2	1	-	.00	-
F	Lomatium spp.	-	3	6	-	1	2	.03	.06
F	Lupinus sericeus	_a 58	_b 160	_a 71	25	66	35	4.92	2.67
F	Penstemon comarrhenus	5	2	4	2	1	4	.00	.02
F	Phlox longifolia	_b 12	_a -	_b 5	5	-	3	-	.01
F	Sphaeralcea coccinea	-	-	1	-	-	1	-	.15
F	Zigadenus paniculatus	-	6	-	-	2	-	.01	.01
Total for Annual Forbs		0	13	0	0	6	0	0.02	0
Total for Perennial Forbs		98	228	131	43	97	66	5.11	3.63
Total for Forbs		98	241	131	43	103	66	5.14	3.63

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --

Herd unit 15 , Study no: 13

Type	Species	Strip Frequency		Average Cover %	
		'04	'09	'04	'09
B	Amelanchier utahensis	2	2	.03	-
B	Artemisia nova	0	2	-	.41
B	Artemisia tridentata vaseyana	93	89	19.32	18.78
B	Chrysothamnus viscidiflorus	77	66	6.09	7.08
B	Gutierrezia sarothrae	0	0	-	-
B	Juniperus osteosperma	0	5	4.61	7.52
B	Opuntia spp.	5	5	.00	.00
B	Pinus edulis	0	3	1.61	2.62
B	Symphoricarpos oreophilus	10	7	.33	.18
Total for Browse		187	179	32.02	36.63

CANOPY COVER --

Herd unit 15 , Study no: 13

Species	Percent Cover '09
Juniperus osteosperma	4
Pinus edulis	3

BASIC COVER --

Herd unit 15 , Study no: 13

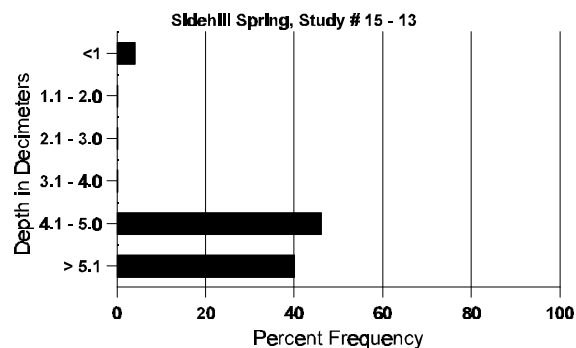
Cover Type	Nested Frequency		Average Cover %		
	'04	'09	'87	'94	'99
Vegetation	303	334	7.25	40.99	53.78
Rock	108	63	.25	2.09	1.99
Pavement	103	88	2.00	.50	.99
Litter	376	350	62.75	32.65	39.14
Cryptogams	12	20	0	.18	.38
Bare Ground	263	231	27.75	25.28	24.26

SOIL ANALYSIS DATA --

Herd Unit 15, Study # 13, Study Name: Sidehill Spring

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
22.2	48.4 (18.1)	7.5	37.3	36.2	26.6	2.1	5.8	83.2	0.5

Stoniness Index



PELLET GROUP DATA --

Herd unit 15 , Study no: 13

Type	Quadrat Frequency		Pellet Transect Days Use/Acre (ha)
	'94	'99	
Rabbit	20	24	N/A
Deer	12	5	18 (44)
Cattle	-	2	25 (62)

BROWSE CHARACTERISTICS --

Herd unit 15 , Study no: 13

A Y G R E		Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Amelanchier utahensis																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	2	1	-	-	-	-	-	-	-	3	-	-	-	60	17	143	3
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40	48	44	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'87			00%			00%			00%							
		'94			33%			00%			00%							
		'99			00%			00%			00%							
Total Plants/Acre (excluding Dead & Seedlings)												'87		0	Dec:	-		
												'94		60		-		
												'99		40		-		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia nova																		
S	87	26	-	-	-	-	-	-	-	-	23	-	3	-	1733		26	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	87	11	-	-	-	-	-	-	-	-	11	-	-	-	733		11	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	87	10	2	-	-	-	-	-	-	-	8	-	4	-	800	9	8	12
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	2	-	-	-	-	-	3	-	-	-	60	19	31	3
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'87		09%			00%			17%										
'94		00%			00%			00%										
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'87	1533	Dec:	-			
												'94	0		-			
												'99	60		-			
Artemisia tridentata vaseyana																		
S	87	7	-	-	-	-	-	-	-	-	6	-	1	-	466		7	
	94	146	-	4	1	-	-	-	-	-	151	-	-	-	3020		151	
	99	12	-	-	-	-	-	-	-	-	12	-	-	-	240		12	
Y	87	31	3	-	-	-	-	-	-	-	28	1	5	-	2266		34	
	94	41	-	-	-	-	-	1	-	-	42	-	-	-	840		42	
	99	39	-	-	-	-	-	1	-	-	38	2	-	-	800		40	
M	87	21	15	-	-	-	-	-	-	-	28	1	7	-	2400	20	19	36
	94	149	5	-	2	-	-	-	-	-	156	-	-	-	3120	51	54	156
	99	212	5	-	3	-	-	-	-	-	220	-	-	-	4400	24	36	220
D	87	1	1	-	-	-	-	-	-	-	2	-	-	-	133		2	
	94	76	-	2	3	-	-	1	-	-	57	-	-	25	1640		82	
	99	35	-	-	1	-	-	-	-	-	17	-	-	19	720		36	
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	1300		65	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'87		26%			00%			17%			+14%							
'94		02%			.71%			09%			+ 5%							
'99		02%			00%			06%										
Total Plants/Acre (excluding Dead & Seedlings)												'87	4799	Dec:	3%			
												'94	5600		29%			
												'99	5920		12%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus viscidiflorus																		
S	87	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3	
	94	196	-	-	-	-	-	2	-	-	198	-	-	-	3960		198	
	99	10	-	-	-	-	-	-	-	-	10	-	-	-	200		10	
Y	87	58	-	-	-	-	-	-	-	-	57	-	1	-	3866		58	
	94	32	2	-	-	-	-	2	-	-	36	-	-	-	720		36	
	99	70	-	-	-	-	-	-	-	-	70	-	-	-	1400		70	
M	87	112	-	-	-	-	-	-	-	-	107	-	5	-	7466	4	8	112
	94	319	-	1	29	-	-	27	-	-	376	-	-	-	7520	31	22	376
	99	476	-	-	-	-	-	1	-	-	477	-	-	-	9540	5	10	477
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
	99	3	-	-	-	-	-	-	-	-	2	-	-	1	60		3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'87		00%			00%			04%			-26%							
'94		.47%			.23%			00%			+24%							
'99		00%			00%			.18%										
Total Plants/Acre (excluding Dead & Seedlings)												'87	11332	Dec:	0%			
												'94	8340		1%			
												'99	11000		1%			
Gutierrezia sarothrae																		
Y	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	87	12	-	-	-	-	-	-	-	-	12	-	-	-	800	9	5	12
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'87		00%			00%			00%										
'94		00%			00%			00%										
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'87	866	Dec:	-			
												'94	0		-			
												'99	0		-			
Juniperus osteosperma																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	5	-	-	-	-	-	-	-	-	5	-	-	-	100	-	-	5
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'87		00%			00%			00%										
'94		00%			00%			00%										
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'87	0	Dec:	-			
												'94	0		-			
												'99	100		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Opuntia spp.																		
S	87	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	94	-	-	-	4	-	-	-	-	-	4	-	-	-	80		4	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66	4	7	
	94	4	-	-	2	-	-	-	-	-	6	-	-	-	120	5	16	
	99	5	-	-	-	-	-	-	-	-	5	-	-	-	100	4	7	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'87		00%			00%			00%			+34%							
'94		00%			00%			00%			-50%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'87	132	Dec:	-			
												'94	200		-			
												'99	100		-			
Pinus edulis																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40	-	-	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'87		00%			00%			00%										
'94		00%			00%			00%										
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'87	0	Dec:	-			
												'94	0		-			
												'99	60		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	99	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	94	6	2	-	-	-	-	1	-	-	9	-	-	-	180	9	46	
	99	6	-	-	-	-	-	-	-	-	6	-	-	-	120	17	24	
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'87		00%			00%			00%										
'94		15%			00%			00%			+ 7%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'87	0	Dec:	0%			
												'94	260		15%			
												'99	280		0%			